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(54) Head restraint for a motor vehicle seat

(57) A head restraint slides up and down, and may tilt, on a one-piece support frame 16 which is fixed in the top of a vehicle seat, and does not move relative to the seat. The head restraint includes an armature made up from two moulded half shells 10,12 which enclose the internal components 22 and form a smooth outer shell on which a trim layer can be mounted. The internal components 22 allow the armature to move up and down and optionally tilt on the frame 16, and for height adjustment may take the form of slide bushes which can slide up and down rods of the support frame 16 and have spring loaded detents which engage with a series of notches on frame 16. For tilting movement, the internal components 22 may each include a horizontally extending socket and a rod fitted in each socket, the assembly of socket and rod being retained within a clamp secured by an adjustable screw. The half shells may be hinged together by an integrally moulded plastics membrane hinge 14.

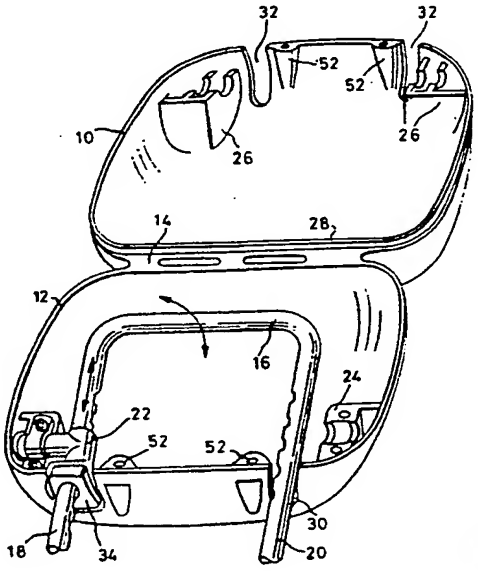

FIG.1.

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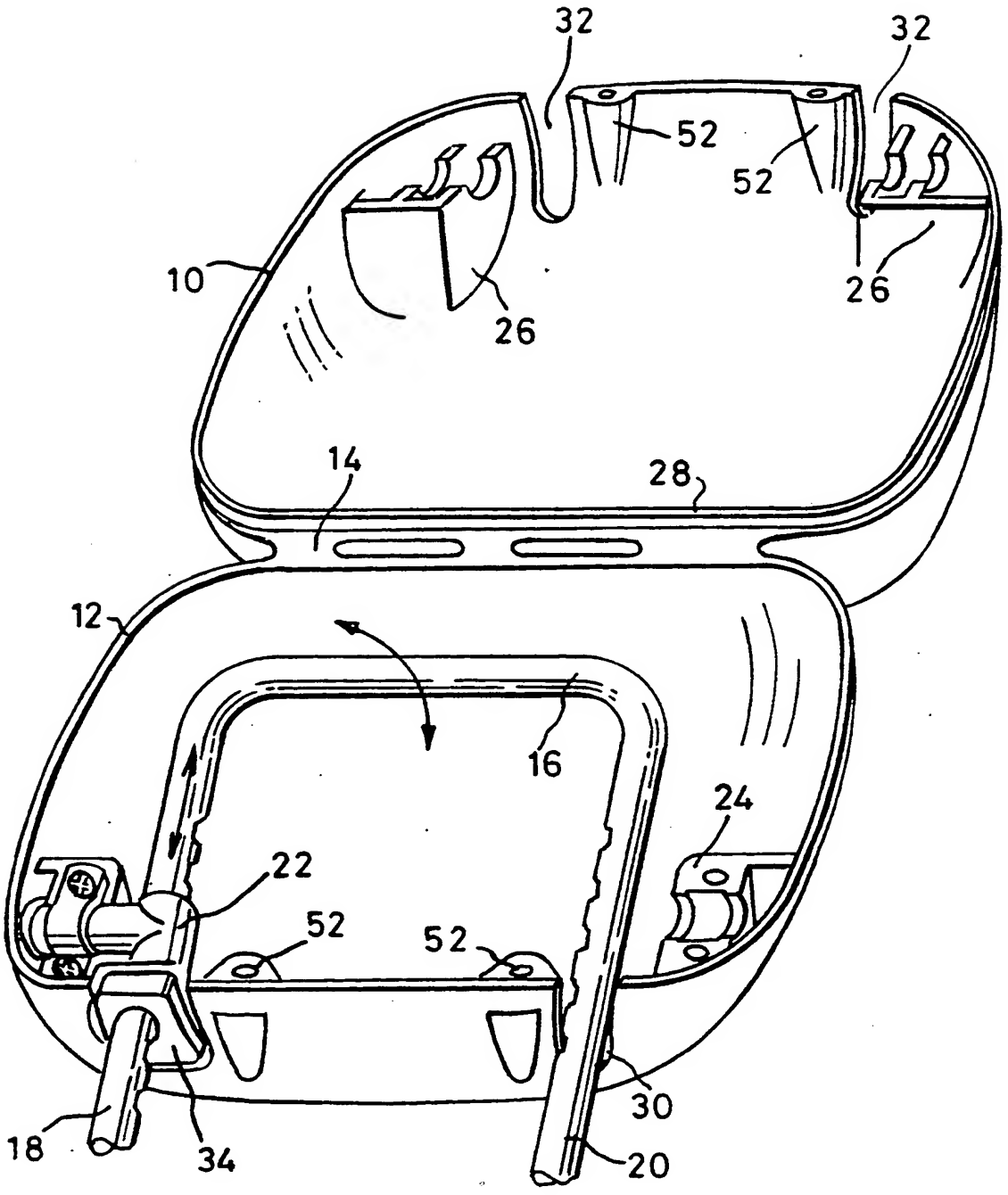

FIG.1.

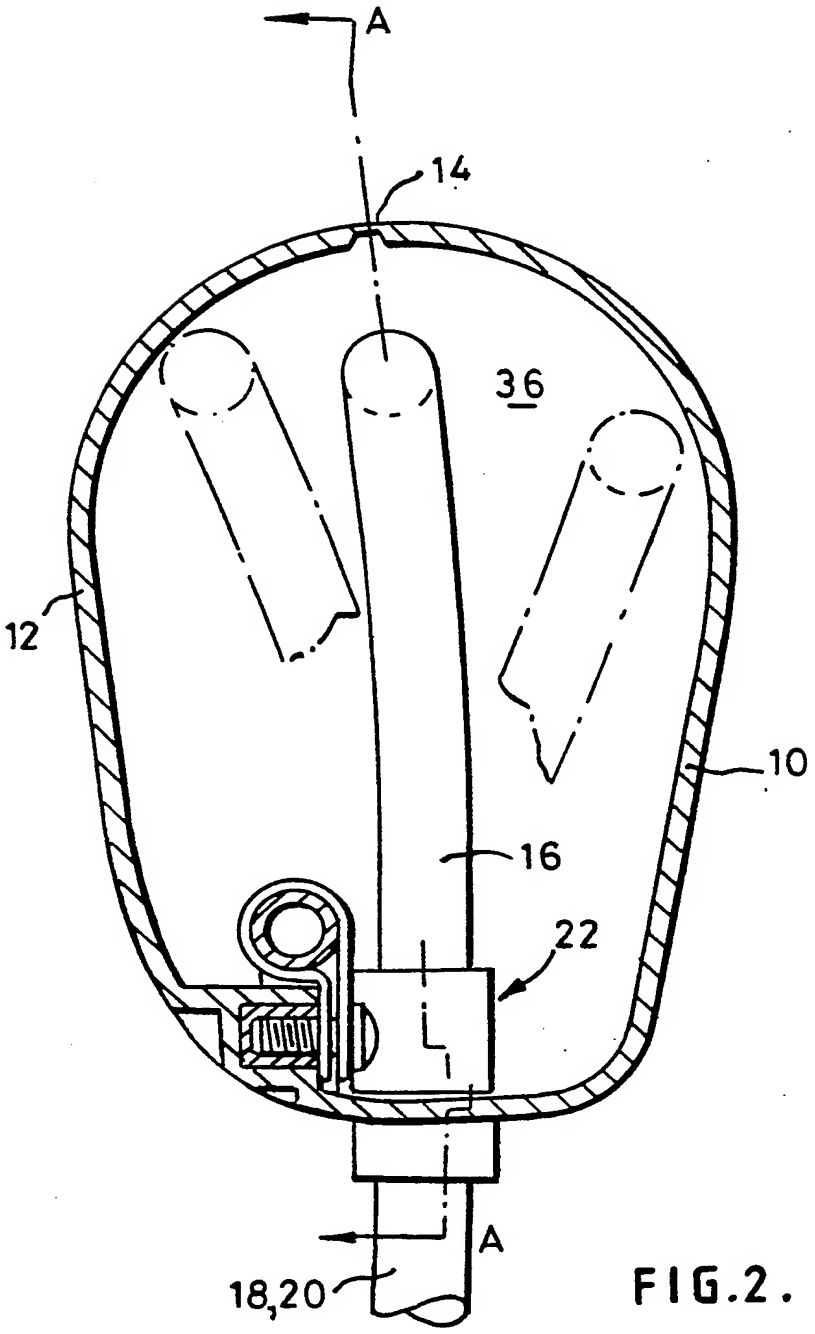

FIG.2.

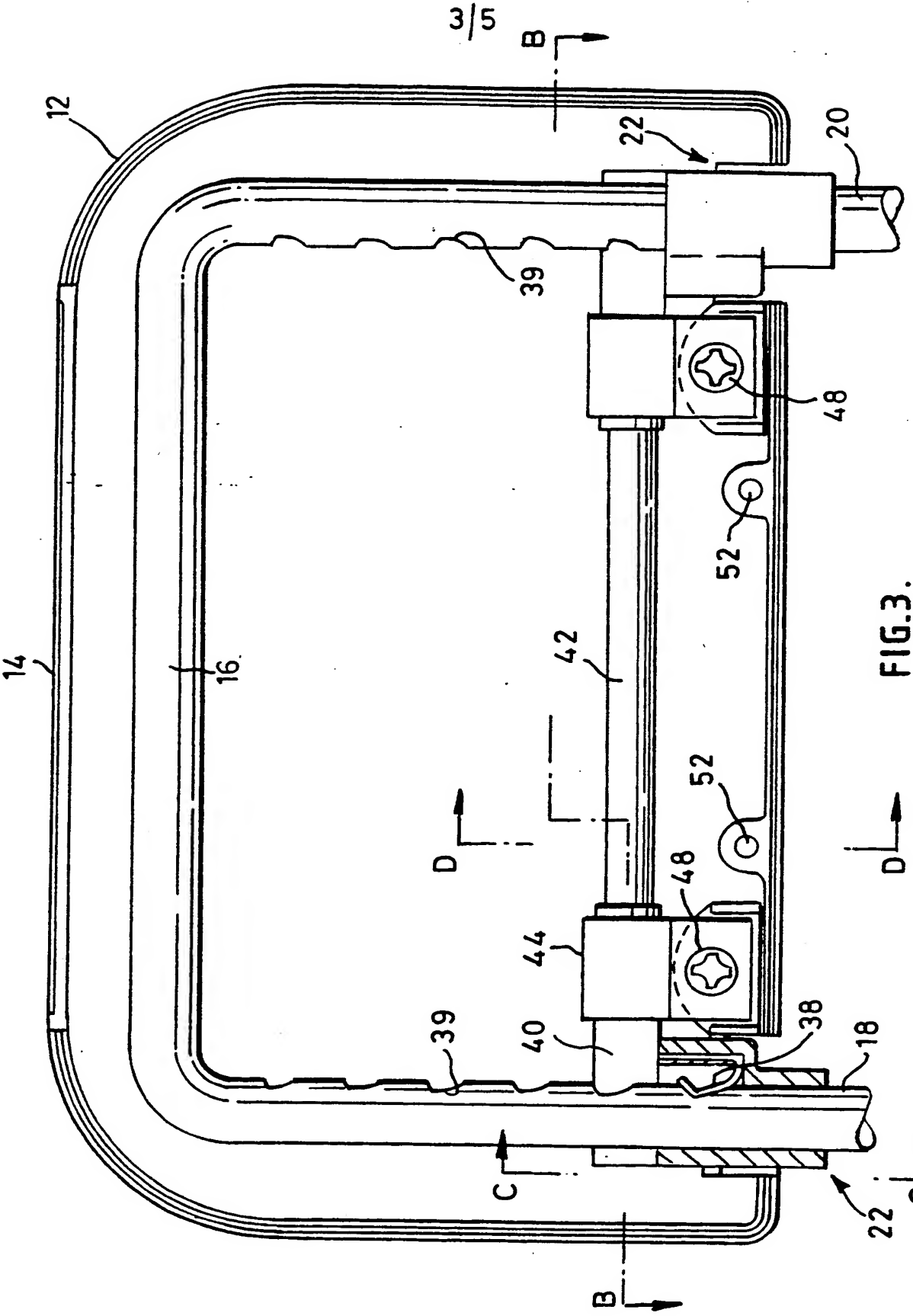

FIG.3.

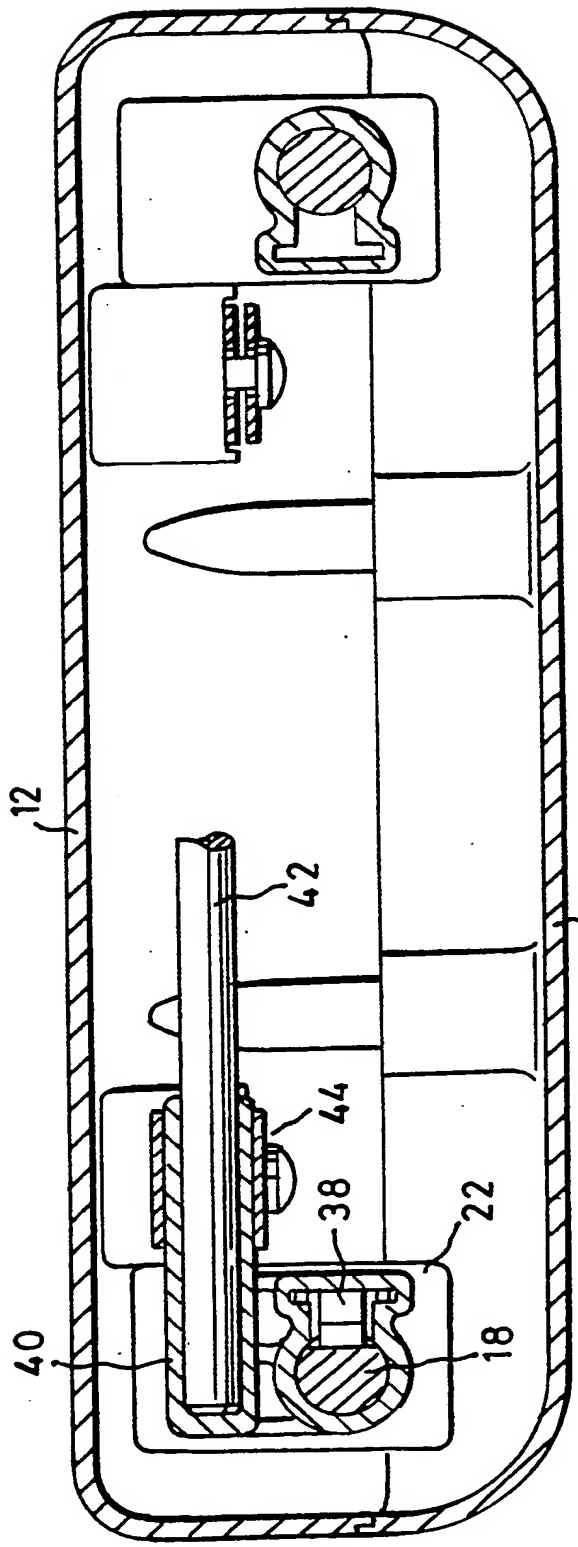

FIG.4.

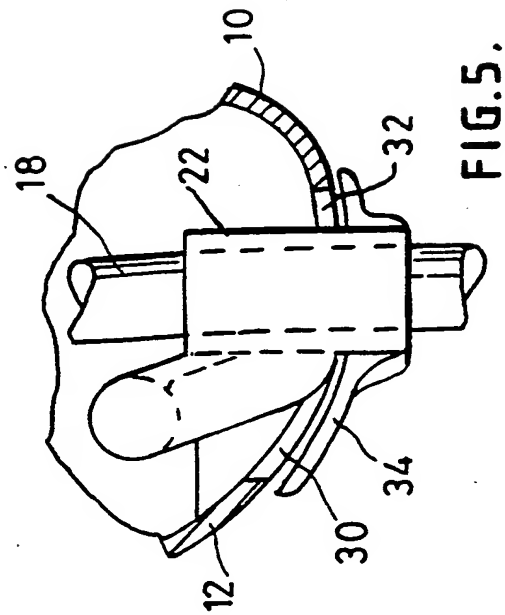

FIG.5.

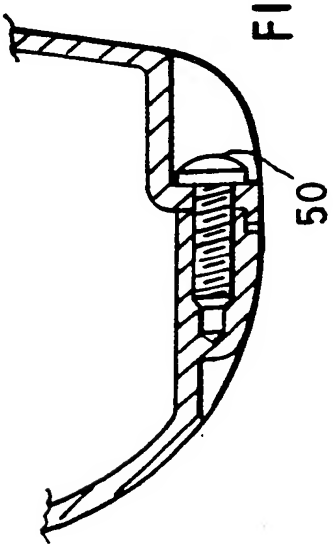

FIG.6.

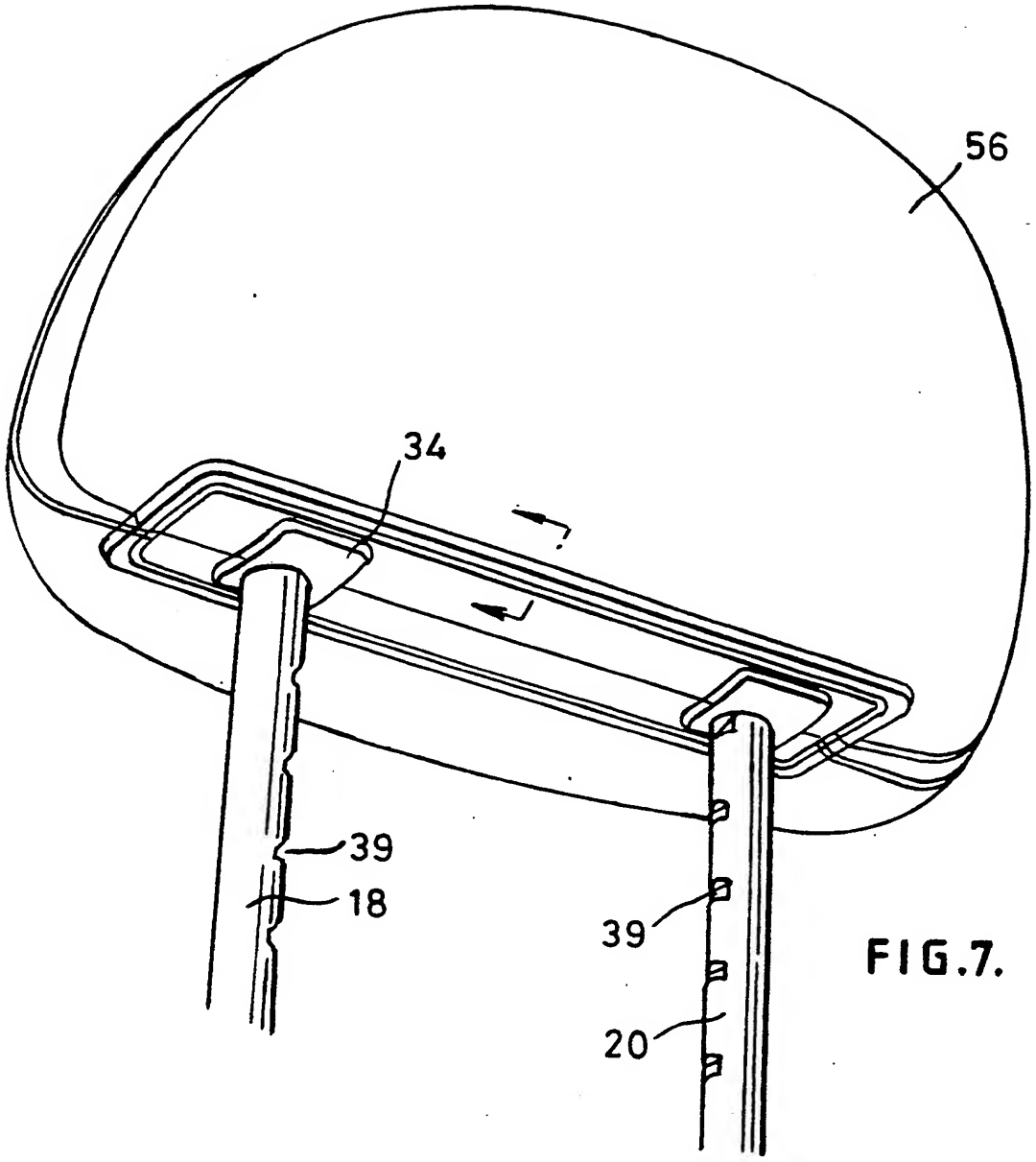

FIG.7.

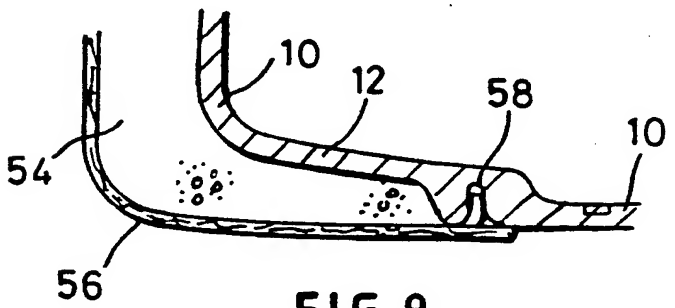

FIG.8.

A HEAD RESTRAINT FOR A MOTOR VEHICLE SEAT

This invention relates to a head restraint for a motor vehicle seat of the type which is adjustable in height relative to the seat back and which may also be adjustable for tilt about a horizontal axis.

Height adjustable head restraints are known where an armature with a generally smooth outer surface is mounted on a support frame which includes two support pillars or rods, and the pillars or rods themselves are movable up and down in sockets fitted to the seat backrest. A disadvantage of this type of head restraint is that allowance has to be made in the construction of the seat back for the travel of the rods, and this compromises the design of the upper part of the seat backrest.

It is also known to mount a head restraint armature on a pair of rods (which may be connected to each other at their top ends), the bottom ends of the rods being non-adjustably fixed to the top of the seat backrest. The head restraint armature is then slidable up and down on the rods, with the armature including slide bushes which slide over the rod.

According to the present invention, there is provided a head restraint for a motor vehicle seat, the head restraint comprising a support frame to be fixed in the backrest of a seat and an armature mounted on the support frame for up and down movement on the frame, wherein the armature comprises two moulded half shells which fit together to form a cavity which can be opened for assembly of the internal components inside the cavity and closed after assembly to enclose the cavity, and means for securing the two shells together in the closed position.
When the shells are closed, the armature preferably presents a smooth and unbroken outer surface.
The ability to produce a smooth unbroken outer surface

makes it possible to produce a foamed in situ covering and possibly a fabric covering around the armature with only a minimum thickness of foam being used and without the foam interfering in any way with the internal components of the head restraint.

The armature is mounted on the support frame and is preferably adjustable both by tilting relative to the frame and by up and down movement on the frame.

The frame is preferably formed from a single piece of metal bar.

The two half shells are preferably hinged together, and the hinge between the two half shells can be an integrally moulded plastics membrane hinge.

Where the head restraint armature is mounted on the support frame for up and down movement only, the internal components are in the form of slide bushes which may be moulded integrally with one of the moulded half shells.

Where the head restraint armature is mounted on the support frame for both up and down movement and tilting movement, the internal components may be mounted within one of the half shells before the half shells are closed. To accommodate the tilting movement, the closed armature may have slots in its lower face to allow the tilting movement, and cover plates may be mounted on the support frame in such a way that the slots are completely covered by the cover plates in all positions of the armature.

The armature may include a groove around the base of the (closed) armature to enable a fabric covering to be retained on the closed armature.

Where tilting movement is required, the internal components may take the form of slide bushes which can slide up and

down on rods of the support frame and which have spring loaded detent arrangements to engage with a series of notches on the rods. The components may fit on the end of a horizontal bar housed within the armature and gripped within a friction-providing clamp which allows the head restraint to be tilted and then holds it in the position to which it has been set.

The head restraint is intended for use with the support frame non-adjustably fitted to a seat backrest. In certain circumstances however it may be desirable for the frame itself to be height adjustable relative to the backrest, in addition to the adjustment available between the frame and the armature.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a first embodiment of a head restraint in accordance with the invention, in the open position;

Figure 2 is a transverse cross-section through a second embodiment of head restraint in accordance with the invention;

Figure 3 is a section through the head restraint of Figure 2 on the lines A-A;

Figure 4 is a section through the head restraint of Figures 2 and 3 on the line B-B from Figure 3;

Figure 5 is a detail of the head restraint of Figure 3 taken on the section line C-C;

Figure 6 is a detail from the head restraint of Figure 3 taken on the section line D-D;

Figure 7 is a perspective view of a completed head restraint in accordance with the invention; and

Figure 8 is a detail, shown in cross-section, of a fabric fixing.

The head restraint shown in Figure 1 comprises two moulding halves 10 and 12 connected together by an integral membrane hinge 14. A one-piece support frame 16 having two support rods 18 and 20 is used to support the armature on the backrest of a motor vehicle seat which is not shown in the Figures. The rods 18 and 20 will normally be rigidly secured to the top of the seat backrest so that there is no adjustment possible between the rods and the seat backrest. However if additional adjustment is required, the rods could slide up and down in the seat backrest.

The frame 16 is secured to the armature by two internal components 22. In Figure 1 only one such component is shown in place, and the mounting position 24 for the opposite component is illustrated on the other side. The component 22 is secured in this instance by screws screwed into a suitable seat moulded into the interior of the half shell 12 and the other half shell 10 has corresponding retaining seats 26.

The half shell 10 has an internal lip 28 so that when the two shells are closed, there is no gap between the shelves along the joint line.

The internal component 22 is intended to allow the armature to tilt on the frame as well as to move up and down on the frame, and the half shells 10 and 12 have slots 30,32 to accommodate this movement. However since it is desirable that the armature should enclose a substantially sealed cavity, cover plates 34 (again only one is shown) are fitted on the rods 18,20 and have dimensions such that they

will at all times cover the slots 30,32.

Figure 2 shows a second embodiment of head restraint, this time shown with the half shells 10 and 12 closed. The hinge 14 is visible at the top of the head restraint. It will be seen that the closed shells enclose an internal cavity 36. The position of the frame 16 is fixed relative to the seat back, but the whole armature can slide up and down on the frame and/or can tilt relative to the frame between two extremes of movement illustrated in phantom lines in Figure 2 where the top of the frame 16 comes into contact with the internal walls of the cavity 36.

Figure 3 shows a detail of how one of the internal components 22 (the other is identical) cooperates with the rod 18 during up and down movement of the armature. The component 22 includes a spring-loaded detent 38 which engages in one of a number of recesses 39 along the length of the bar. The spring loading of the detent 38 will be such that a firm pull upwards or push downwards on the armature will be sufficient to cause the detent to lift out of the recess in which it is engaged, and the detent can then drop into one of the other recesses depending on the height selected for the armature.

Figure 4 shows more detail of the tilting movement which is possible with this head restraint. The component 22 includes a tubular socket 40 which extends in a direction horizontally across the armature. A rod 42 is fitted in each such socket, and the assembly of sockets and rods are retained within a clamp arrangement 44 secured by a screw 48. By tightening the screw 48, the clamping force and therefore the resistance to tilting of the head restraint armature can be varied.

The two half shells 10 and 12 are secured together in the closed position by screws 50 illustrated in Figure 6. These screws engage in apertures 52 formed in the two

halves. In an alternative embodiment (not shown) the two half shells could be held closed by an integrally moulded snap-locking formation.

To assemble the head restraint, the two half shells 10 and 12 are laid open as shown in Figure 1. The support frame 16 with the internal components 22 mounted on it is then secured in place, and the half shells are closed and secured by the screws 50.

Where height adjustment only is required, the internal components 22 need only take the form of slide bushes with a spring loaded detent, and the whole of each component can then be integrally moulded with one or other of the half shells 10 or 12. In this case the free ends of the rods 18 and 20 would be inserted through the integrally moulded slide bushes with the two half shells fully opened. The entire armature consisting of the two half shells, the slide bushes and a snap-locking feature between the half shells could then be made in one moulding operation.

Once the two halves of the armature have been closed and the head restraint is functionally complete, it will normally be covered with a suitable covering which typically would take the form of a layer of resilient foam covered by fabric. Because the two half shells completely close the internal cavity 36, and the functional components are located inside, it is possible to apply a layer of resilient foam by direct foaming around the armature without any concern about foam penetration interfering with the functional components. At the same time, or in a separate process, a fabric covering 56 is placed around the foam 54. The edges of the fabric 56 can be tucked into grooves 58 formed around the base of the armature to provide a tidy finish. The fabric edges can alternatively be concealed in other ways, e.g. behind a specially formed flange.

The head restraint described allows adequate adjustability on a support frame which is fixed relative to the seat and produces a smooth outer surface which forms an excellent base on which to mount any desired decorative outer covering.

CLAIMS

1. A head restraint for a motor vehicle seat, the head restraint comprising a support frame and an armature mounted on the support frame for up and down movement on the frame, wherein the armature comprises two moulded half shells which fit together to form a cavity which can be opened for assembly of the internal components inside the cavity and closed after assembly to enclose the cavity, and means for securing the two shells together in the closed position.

2. A head restraint as claimed in Claim 1, wherein the outer surfaces of the two half shells are smooth and when the shell is closed, the armature presents a smooth and unbroken outer surface.

3. A head restraint as claimed in Claim 1 or Claim 2, wherein the two half shells are hinged together.

4. A head restraint as claimed in Claim 3, wherein the hinge is an integrally moulded plastics membrane hinge.

5. A head restraint as claimed in any preceding claim, wherein the support frame is formed in one piece.

6. A head restraint as claimed in any preceding claim, wherein the head restraint armature is mounted on the support frame for up and down movement only, and the internal components are in the form of slide bushes which may be moulded integrally with one of the moulded half shells.

7. A head restraint as claimed in any one of Claims 1 to 5, wherein the armature is mounted on the support frame for both tilting movement and up and down movement on the frame.

8. A head restraint as claimed in Claim 7, wherein the internal components are mounted within one of the half shells before the half shells are closed.

9. A head restraint as claimed in Claim 7 or Claim 8, wherein the closed armature has slots in its lower face to allow the tilting movement, and cover plates are mounted on the support frame in such a way that the slots are completely covered by the cover plates in all positions of the armature.

10. A head restraint as claimed in any one of Claims 7 to 9, wherein the internal components take the form of slide bushes which can slide up and down rods of the support frame and have spring loaded detent arrangements to engage with a series of notches on the frame

11. A head restraint as claimed in Claim 10, wherein the detent arrangements fit on the end of a horizontal bar housed within the armature and gripped within a friction-providing clamp which allows the head restraint to be tilted and then holds it in the position to which it has been set.

12. A head restraint as claimed in any preceding claim, wherein the armature includes a groove around the base of the (closed) armature to enable a fabric covering to be retained on the closed armature.

12. A head restraint as claimed in any preceding claim, wherein the half shells have edge regions which fit together without leaving any gap between themselves.

13. A head restraint for a motor vehicle seat, substantially as herein described with reference to the accompanying drawings.

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